E-government and Technological Utopianism: Exploring Zambia's Challenges and Opportunities

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Abstract: This article presents an empirical study that was conducted in three towns (Lusaka, Livingstone and Kitwe) in Zambia to ascertain the awareness of citizens about the anticipated value that e-government adds to public service provision. Awareness entails that citizens are able to identify the opportunities that e-government has to offer in the delivery of public services. Using a Mixed Methods Research (MMR) approach, the study measured the perception of citizens on the overall e-government agenda. Spearman's *rho* was used to determine concurrent and construct validity of the data collection instruments. Restricted factor analysis with Kaiser Normalization identified eight predictor factors explaining 23 percent of the variance in the model indicating acceptance and/or awareness of e-government applications. The results of the research indicate that with the likelihood of a majority of citizens aware of and utilising e-government once it is globally rolled out, there are chances that e-government may positively impact on the bureaucratic nature of government and ultimately improve public service delivery in Zambia. Further, this research suggests there are encouraging indications for effective development of e-government in Zambia. The limitation of the study is that the sampled population may not be statistically representative of the general population in Zambia and therefore it is not possible to generalise the outcomes of this research.

Keywords: e-government, Zambia, service efficiency, corruption, technology acceptance, e-Participation, e-Inclusiveness

1 Introduction

Pronouncements on the possible impact of electronic government (e-government – use of technology in the public service delivery value chains) towards revitalization of public sector information management practices and service delivery have been grandiose. Some of these pronouncements have posited that e-government is an indispensable necessity for achieving a differentiated, inclusive and democratic society and is a lever for reducing the corruption which is endemic in Africa (Misra, 2007: Bhatnagar, Rao, Singh, Vaidya, & Mandal, 2007). When implemented successfully, there is a chance that e-government may culminate in improved public service delivery which is relevant, efficient and appropriate. It would further lead to reduction in the cost of public services and create responsive governance processes where the core concerns are the aspirations of the consumers of e-government services i.e. citizens and businesses. These benefits may be synonymous with technological utopianism (in that there is belief that technology will altogether revitalize the experience of human life or that technology is the panacea of all problems humans face in their lives) once context-aware e-government solutions are in place. There is common belief, therefore, that e-government is a lever that can be applied towards changing outmoded bureaucracies (Rowley, 2011).

Despite being researched for over two decades, e-government is still considered a novel phenomenon. This is compounded by its multi-dimensionality. Its increased implementation by different governments throughout the world is being facilitated by new schools of thought such as the New Public Management (NPM) and the Public Governance School (PGS) founded on the belief that the market is more efficient than government establishments in distributing society's resources (Khalil, 2011). This entails that any interventions with regards to public service delivery should consider the characteristics and anticipations of the market (citizens and businesses). Consequently, public service management or delivery interventions which follow the citizen or business-centric design have a higher probability of success. In this regard, e-government design should concentrate on understanding the multi-dimensionality of the e-government consumer base.

Despite the many advantages garnered from successful e-government implementation, there is also a myriad of disadvantages (Ndou, 2004; Zhan-qi, Xue & Zhang, 2009; Schuppan, 2009). An example of such disadvantages may be the likelihood of excluding citizens and businesses that have no access to technology due to the digital divide (e-exclusion), or generally a lack of engagement due to the anticipated low levels of trust by citizens of the e-government platforms. Given the cognition of the advantages and disadvantages of e-government implementation, this article discusses the different

challenges that are eminent in affluent e-government development in Zambia. Further, the article highlights the opportunities that can be amassed from successful implementation of e-government in Zambia.

The research concept utilised in this study is premised on the Technology Acceptance Model (TAM) and the Technology Enactment Framework (TEF) to investigate the awareness, challenges and opportunities for e-government and both the individual and the institutional levels. The research employed the MMR research approach which enables the investigation of one phenomenon from more than one vantage point. For example, the results of one data collection approach were compared with different data collection methods investing one phenomenon to test validity and reliability of the results. The MMR approach entails that triangulation of research approaches was done at all the stages of the research cycle starting from the research conceptualisation stage.

This research provides insights on what might be the case regarding awareness of e-government solutions and challenges or opportunities with regards to e-government development in Zambia. The limitation of the study is that the selected sample in these three towns may not be representative of the whole population in Zambia to guarantee statistical generalization of the research results.

2 Background

Zambia has been a victim of the all-pervasive scourge of corruption that has permeated almost all levels of the socio-economic hierarchy – from the executive to the general citizen levels (Tangier, 2002, Anti-Corruption Resource Centre/Transparency International, 2008, Business Anti-Corruption Portal, 2011). The advantages of e-government implementation highlighted above, makes it imperative that Zambia introduces ICTs in its public service delivery platforms. It has been noted that corruption became a norm during the period between 1991 and 2001 when the country literally became an inert state with the public service rendered completely ineffective and run by " the Head of State and an 'inner sanctum' from the Executive Residence – the State House" (Tangier, 2002). Today, corruption is well embedded in the Zambian economy due to lack of government's disclosure of information to the general public such that monitoring/evaluation of the transparency of government agencies is left to the discretion of a few individuals (Business Anti-Corruption Portal, 2011). Tangier (2002) assert that during the period 1991 to 2001, corruption was so rampant in the public service that almost all appointments and promotions where usurped by the President and his cabal of advisors. Most appointments and promotions went to political cadres or relatives with no regard to the '*principle of merit'*. Research, as indicated in Table 1 below, has shown that e-government has been an effective tool in the fight against corruption and may as well be utilised in the Zambian context as an effective tool towards the mitigation of corruption in the public sector.

Table 1: e-Government and Corruption Mitigation

Project name and location	Impact	Source
Tax department, Pakistan	Contact between tax collectors and taxpayers reduced, and correspondingly chances of corruption done away with	CTDI, 2002
Rural property records online, India	Removed opportunities for local officers to accept bribes	Bhatnagar, 2003
Bhoomi electronic land record system in Karnataka, India	Reduced waiting time and saved Rs. 806 million in bribes to local officers	Chawla & Bhatnagar, 2004
Compra e-procurement system, Chile	System saves approximately US $150 million annually by preventing price fixing or inflation by corrupt officials and contractors	Shim & Eom, 2008
Department of Budget and Management (DBM), The Philippines	Implementation of an online e-Procurement system (http://www.procurementservice.org/). This system allows the public to bid for government needs. Led to increased transparency in tendering procedures	Gonzalez, 2007
Restructuring of the entire tax system, Pakistan	Reduced direct contact between citizens and tax officials to reduce opportunities for bribes	Anderson, 2009
Ghana Community Network — GCNet, Ghana	Bureaucratic inefficiency reduced and corruption reduced	Schuppan, 2009
e-Procurement system of	Reduced price fixing	Anderson, 2009

Project name and location	Impact	Source
government agencies, The Philippines	and allowed public accountability	
Integrated Tax Administration System in Tanzania — ITAX	Transparency and tax revenue has increased, while processing time and the possibility of fraud have been reduced	Schuppan, 2009
e-Government implementation, Fiji	Reduced corruption, increased confidence in government, and has increased overall responsiveness of the government	Pathak, Naz, Rahman, Smith, & Agarwai, 2009
Online Procedures Enhancement for civil applications (OPEN) system, South Korea	Increased speed with which government responds to citizen's applications, reduced corruption, and increased citizens' confidence in government	Kim, S.C., Kim, H.J., & Lee, H.J., 2009 Iqbal, & Jin, 2008

Beside corruption and lack of free flow of government information (due to unwillingness to enact the Freedom of Information (FOI) legislation as this would compel politicians to disclose information about their operations (Hamooya, 2006), among other reasons), the overall efficiency and effectiveness of the public sector in Zambia leaves much to be desired (Matenga, 1998; Kafunda, 2007; Henriot, 2007). In addition, the country has since its colonial period experienced a phenomenon where governments across the years have always resorted to destroying the evidence of records as a gesture of 'running away' from accountability. Such practices have hampered effective service delivery and created inability to account and to be held to account. Another impediment to service delivery has been over-reliance on manual processes by government entities. For example, one needs to wait for more than six months for a passport to be issued because the Passport Office relies on manual processes and it is always overwhelmed by applications. Given such a state of affairs, e-government provides opportunities to mitigate the evident ills and quagmires in the governance channels in Zambia.

Many e-government interventions have been motivated by a variety of factors with respect to context (and market). However, the general motivation for implementing e-government has been to revolutionise the semiotics of the public sector culminating in increased responsiveness and efficiency (Jones, Irani & Sharif, 2007; Bwalya & Healy, 2010). Nevertheless, there are challenges that have been identified as likely to exacerbate marginalisation of territories in as far as adoption and usage of technology. Common to many developing nations, Neville (2003) observes, is that effective e-government development can be hampered by a lack of appropriate infrastructure, dilapidated energy grids low international bandwidths and exorbitant costs to access ICTs. These factors, which act as bottlenecks to successful e-government development, should be considered in the design of any e-government solutions distinct to merely copying interventions that worked in a developed nation which may not necessarily work in a developing world context. Achieving meaningful e-government development, however, is a process that needs well-thought out and context-aware strategies. Context-aware strategies incorporate in their designs the characteristics of the local context such as the level of education of the people, likelihood of access to ICTs, computer literacy, and other e-Citizen-ready requirements.

Global access to information is desired because plural politics and national development can only be achieved if there is unlimited access to information by the citizens and other watchdog agencies such as political parties and the donor community (Hamooya, 2006). In order to achieve this, the deployment of local context-relevant e-government solutions for a developing country like Zambia, must address the following questions: In what ways will e-government improve citizens' access and promote global access to information? Does merely mounting information on online platforms unequivocally improve access to information for citizens and businesses in Zambia? What inherent factors need to be considered to promote public information access in the case of Zambia? What are the best strategies to design e-government platforms and what marketing campaigns should be employed in the case of Zambia? What is the best platform for delivering e-government applications in Zambia? And what languages should be utilised on e-government platforms given the 73 languages spoken in Zambia? These questions emanate from the fact that a mere good supply of ICT interventions or e-government initiatives may not necessarily translate into effective and responsive government service delivery to citizens. In attempting to answer some of these questions, this article employs the MMR approach to probe the likelihood of successfully implementing e-government in Zambia.

Given the above, this article investigates the challenges of e-government implementation and the opportunities that e-government may likely present on the Zambian context and whether citizens were aware of the anticipated benefits of e-government solutions. Further, the article weighed the balance between the supply and demand aspects of e-government in Zambia.

3 Theoretical Framework and Context

While e-government should not be technology-centric (as technology is just an enabler for e-government applications), the acceptance of technology in the different value chains by potential e-government consumers is core to its success. Technology has to be accepted as an authentic vehicle for delivering public services by government employees, citizens businesses, and other stakeholders. To fast-track this process of technology acceptance, there is need for institutionalisation of technology as a valid platform in the different governance channels (acceptance of technology at an institutional level). In order to do this, it is important to be conversant with the different government entities such as the forms of organisations, organisational arrangements and the different business processes and the technology platforms available. The Technology Enactment Framework (TEF) has largely been utilised to understand the complexity of the public sector's institutional design and how technology can be enacted.

The TEF is a framework that aims to identify the cardinal factors that are at the centre of technology encapsulation into the different organizational value chains and structures (Cordella & Iannacci, 2010). It is based on the institutionalisation theory, governance and bureaucracy. The understanding of the complexity of the undercurrent forces impacting on technology adoption in an organizational context complements Orlikowski's notion of duality of technology (Orlikowski, 1992) and the broader socio-technical tradition that looks at the inter-relationships between social, organizational dimensions and technology (Cordella & Iannacci, 2010). Figure 1 below shows the TEF as proposed by Fountain (2001).

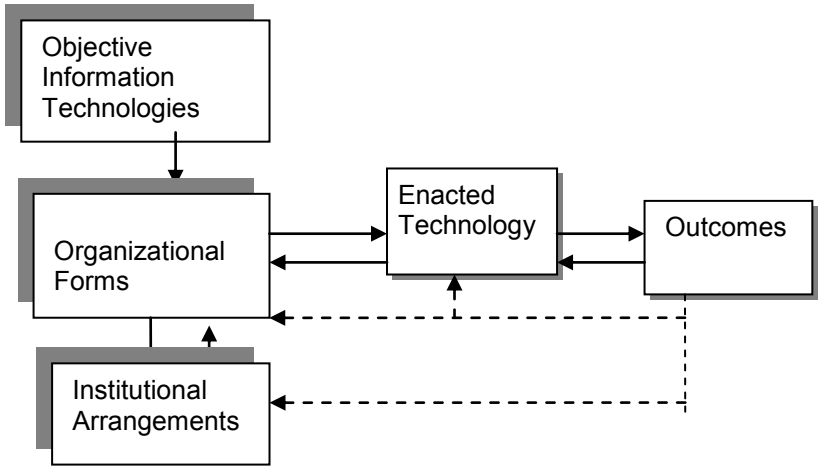


Figure 1: Technology Enactment Framework (Fountain, 2001)

Coupled with the institutionalisation theory, the TEF aims to find ways on how technology can be appositely introduced into the government business processes and its acceptance and adoption by government employees in their operations. Thus, the TEF is mainly useful to investigate the interventions put in place on the supply side. e-government. On the demand side, acceptance models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Usage of Technology (UTAUT) have largely been utilised to explain the factors that influence individuals' adoption of technology (Davis, 1989; Venkatesh *et al*., 2003). Apart from the common factors captured by the generic acceptance models, cultural differences have also been referenced in explaining the disparity in e-government development across nations (Khalil, 2011). Central to the issue of culture is the political will of government, which when it exists, will influence the types of interventions that are to be acutely pursued on the supply side of e-government whereas, among other factors, the cultural milieu in a given area influences the way people value information and correspondingly accept e-government as an desirable platform to access government information and services. To sum it all, Titah and Barki (2006) have posited that the adoption of e-government, to a

greater or lesser extent, depends on how adequate the following facets have been considered in the design of e-government solutions: organizational; technological; socio-economic; behavioural; and cultural connotations. These facets are further dependent on the local context for which e-government solutions are being designed.

4 Methodology

4.1 General description

This study utilised a MMR approach where a phenomenon investigated is probed using multiple approaches. Johnson, Onwuegbuzie and Turner (2007, p.123) define MMR as a

type of research in which the researcher or team of researchers combine elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative view points, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration".

In this research, for example, the questionnaire was designed to collect both qualitative and quantitative information. To do this, both open-ended and closed-ended questions were included. The questionnaire aimed to collect information on citizens' awareness of e-government implementation in Zambia, challenges faces when interacting with e-government platforms and ways on which the citizens perceive e-government should be improved. This was complimented by interviews and rigorous literature and document reviews. Purposive sampling was utilised to identify and group the participants. Multivariate approaches were used analyse the data that was collected.

To establish construct validity and reliability of the data collection instrument, the questionnaire was distributed to a sample of 55 respondents in the pilot study. This measured the degree of instrument consistency or repeatable instrument competency. Exploratory Factor Analysis (EFA) was used to support construct validity and reliability of the survey. Construct validity, as one method of survey validation, is a necessary step in the research process to ensure that a multi-item survey instrument accurately measures the constructs under investigation.

To analyze the data, this study utilized rigorous multivariate statistical analysis (standard multiple regression analysis) and tested the hypotheses using the Analysis of Variance (ANOVA) technique. Prior to the statistical analysis, the original dataset was analysed to ensure there was no violation of the assumptions of normality, linearity (residuals should have a straight-line relationship with predicted dependent variable scores), multicollinearity (evident when the variables are strongly correlated (r = 0.9 and above)), and homoscedasticity (variance of the residuals about the predicted dependent variable scores should be the same for all the predicted scores). To achieve this, a number of statistical approaches were utilised. For example, the Kaiser-Meyer-Olkin measure (KMO-test) was used to measure the sampling adequacy of the population of the participants in the study; the Shapiro-Wilk Test was used for testing for normality (tests the hypothesis the dataset under scrutiny follows a normal distribution) in combination with the central limit theorem; Bartlett's Test of Sphericity was administered to test the null hypothesis that the correlation matrix is an identity matrix (all diagonal elements are 1 and all off diagonal elements are 0); and Komolgorov-Smirnov and Shapiro-Wilk test was used to test for normality. This confirmed the need for data transformation using Log_{10} (6-X) to remove the negative skewness evident in the preliminary analysis.

4.2 Hypotheses

Table 2 presents the hypotheses that were tested in this study to ascertain the perceptions on the demand side of e-government implementation in Zambia. All the hypotheses are premised on the TAM and the UTAUT models.

Table 2: Study hypotheses

H1: Perceived ease of use of e-government websites will positively influence the perception of usefulness of e-government websites and applications.
H2: Perceived usefulness of e-government websites will positively influence citizen's adoption (actual usage) of e-government websites and applications.
H3: Perceived ease of use (usability) of e-government websites will positively influence citizen's adoption of e-government websites and applications.
H4: Appropriate ICT infrastructure positively impacts on usability and correspondingly on Perceived Ease of Use (PEOU);
H5: Trust directly influences behavioural intention to engage in e-government applications;
H6: The level of computer self-efficacy will impact on the actual use of an e-government system by an individual.
H7: Positive ICT developments will facilitate actual usage and correspondingly continuance usage of e-government applications.
H8: Appropriate ICT infrastructure coupled with higher Perceived Ease of Use (PEOU) will culminate into improved overall Perceived Usefulness (PU) of e-government platform.

These hypotheses are tested to understand individuals' adoption of e-government in Zambia and to highlight the inherent factors that influence its adoption. With reference to the TEF, effective adoption of e-government involves integrating ICTs into the business processes of the organisation. This can only be facilitated if the government employees are willing to domesticate ICTs as a platform for effective public service delivery and that the general citizenry have trust in e-government solutions. Therefore, this study investigated the willingness of individuals to adopt and continue using ICTs as they execute their duties when citizens want to interact with government establishments.

4.3 Study population

Individuals from different walks of life participated in this research. The study design is such that it comprised a series of preliminary tests to test the validity, reliability and feasibility of the research instruments. Essentially, the research was divided into the pilot (preliminary) and the main study. In the preliminary stages, interviews were conducted with a total of 22 government workers from line ministries and parastatal bodies in order to understand the current status of e-government implementation in Zambia, what challenges are being faced and what the future prospects are. The pilot study targeted a sample of 55 respondents with 40 of them eventually taking part in the study, representing a 73% response rate. In the main study, a total of 721 questionnaires were distributed to potential study participants. Of these, 411 questionnaires were returned for analysis and eventually 408 questionnaires were included in the final analysis, representing 57% overall response rate

Table 3 shows the age characteristics of the participants.

Table 3: Age distribution of the participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16-21 years	34	8.3	8.6	8.6
	22-25 years	76	18.6	19.3	27.9
	26-35 years	114	27.9	28.9	56.9
	36-49 years	120	29.3	30.5	87.3
	50-59 years	46	11.2	11.7	99.0
	60 and older	4	1.0	1.0	100.0
	Total	394	96.3	100.0	
Missing	System	15	3.7		
Total		409	100.0		

Table 4 below shows some characteristics of the research participants. The respondents were taken from an age range of 16 to 70, most of them being African by race with four main languages being spoken: English, Bemba, Tonga, and Nyanja. Most of the respondents (76.1%) were in formal employment.

Table 4: Characteristics of participants

Parameter	Subject (N = 408)
Age (mean, range)	33, 16-70
Gender (male, female, no response)	220, 164, 24
Race/ethnicity (African, other)	338, 21
Native language (English, Bemba, Tonga, Nyanja, others)	16, 121, 93, 77, 102
Education (PhD, Masters, Bachelors, other)	87, 22, 128, 172
Employment status (employed, unemployed)	312, 97

The characteristics of the participants in the study show that different age groups were involved, gender balance was observed together with the diversity in spoken languages, education and employment status.

4.4 Preparation for multivariate analysis

Factor analysis was performed using *oblique* rotation with Kaiser Normalisation which derived factor loadings based on the assumption that the factors are uncorrelated. Oblique rotation gives the correlation between the factors in addition to the loadings. Before the factor analysis, the Kaiser-Meyer-Olkin (KMO) test was administered and the value obtained for the given dataset is 0.872 which is close to one (1) - showing greater suitability for factor analysis. Table 5 shows the KMO results $\chi 2(2556)=16525.019$, $p<0.001$.

Table 5: KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.872
Bartlett's Test of Sphericity	Approx. Chi-Square
df	2556
Sig.	.000

Using EFA, the following factors were included in the analysis of the status of e-government development in Zambia: Log_ICTInfra (logarithmic value of the ICT infrastructure), PEOU, Log_PU, Log_Comp_SE, Log_Actual_Usage, Trust, and Cont_Usage. Construct validity and reliability testing of the research instruments was done with the help of observing the nonparametric correlations of the dataset using Spearman's rho coefficients which showed significant correlations amongst the measured variables.

Testing for normality was done using the Kolmogorov-Smirnov and the Shapiro-Wilk tests as shown in Table 6. The results show that all the factors showed higher statistical significance.

Table 6: Tests for Normality on all measured items

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ICT_infra	.132	374	.000	.901	374	.000
PEOU	.142	377	.000	.972	377	.000
PU	.117	401	.000	.930	401	.000
Comp_SE	.178	405	.000	.880	405	.000
Actual_usage	.129	405	.000	.899	405	.000
Trust	.149	377	.000	.951	377	.000
Cont_Usage	.147	374	.000	.924	374	.000

Lilliefors Significance Correction

Where, ICT_infra = ICT infrastructute; PEOU = Perceived Ease of Use; PU = Perceived Usefulness; Comp_SE = Computer self efficacy; Actual_Usage = Actual usage of e-government applications; and Cont_Usage = continuous usage of e-government applications

The response to the individual questions relating to the identified factors is shown by the case diagnostics presented in Table 7. It can be inferred from Table 7 that a majority of the respondents answered the specific questions on the questionnaire related to the 7 factors.

Table 7: Case Processing Summary

	Cases					
	Valid		**Missing**		**Total**	
	N	Percent	N	Percent	N	Percent
ICT Infrastructure	374	91.7%	34	8.3%	408	100.0%
PEOU	377	92.4%	31	7.6%	408	100.0%
PU	401	98.3%	7	1.7%	408	100.0%
Comp_SE	405	99.3%	3	.7%	408	100.0%
Actual_usage	405	99.3%	3	.7%	408	100.0%
Trust	377	92.4%	31	7.6%	408	100.0%
Cont_Usage	374	91.7%	34	8.3%	408	100.0%

The following section details the procedures utilised in testing the hypotheses.

4.5 Testing the hypotheses

The procedures used for testing all the hypotheses were the same in this study. For purposes of illustration, the detailed procedures used in this endeavor are only shown for Hypothesis 1 (H1).

To be included in the testing procedures, it was necessary that all the outliers be removed beforehand. Several attempts were made with different forms of PU. The first one involved using the square root of PU after the cases with large residuals (outliers) were removed. This did not provide acceptable values. Thereafter, regression was performed using the logarithmic value of 'PU'- (Log_PU) and this was included in the analysis of the dataset. Table 8 shows the Pearson's correlation between the dependent and independent variable (correlation exists with higher statistical significance). All requested variables on PEOU had been entered and the log_PU was the dependent variable. Data from 377 participants was involved to analyze this hypothesis.

Table 8: Pearson's correlations on H1 variables

		Log_PU	PEOU
Pearson Correlation	Log_PU	1.000	-.371
	PEOU	-.371	1.000
Sig. (1-tailed)	Log_PU	.	.000
	PEOU	.000	.
N	Log_PU	401	377
	PEOU	377	377

Table 9 shows the contribution of variance (Predictive value - R^2) of PEOU on PU. R squared (R^2) details the proportion of variation in the dependent variable as explained by the regression model. R^2 = the coefficient of determination. This value determines how much of the variation in one variable is due to the other variable. For H1, R^2 value of 13.7 means that the prediction capacity of the regression model obtained from this dataset explains that 13.7% of the variation in the outcome is determined by the predictor variable.

Table 9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.371[a]	.137	.135	.13897

Table 10 below shows the overall variance in the dataset. It can be observed that with all the tests of the ANOVA, the data is statistically significant.

Table 10: Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.153	1	1.153	59.702	.000[a]
	Residual	7.243	375	.019		
	Total	8.396	376			

A regression analysis, predicting Log_PU from PEOU, was highly statistically significant with

$$F(1) = 59.702,\ p < .001.$$

Table 11 showing the variables utilised in showing the predicting capacity of the regression model of H1. It can be observed that the *t* values associated with the Log_PU scores show statistical significance at the same level the F statistics was (0.001). The regression equation for this case is:

$$\text{Log\_PU} = 0.497 - 0.070\ \text{PEOU}$$

Table 11: Model diagnostics

Case Number	Std. Residual	Log_PU	Predicted Value	Residual
-------- 44	-3.071	.00	.4267	-.42674

Dependent Variable: Log_PU

The residual statistics (highlighted in Table 12) confirmed that the Mahalanobis distance has an acceptable value for one independent variable and does not exceed the Chi-square critical value for 1 degree of freedom which is 10.828.

Table 12: Residual Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.1461	.4267	.2794	.05538	377
Stud. Deleted Residual	-3.141	2.481	.000	1.012	377
Mahal. Distance	.016	7.081	.997	1.454	377
Cook's Distance	.000	.106	.003	.007	377

a. Dependent Variable: Log_PU

These procedures were repeated for the remaining 7 hypotheses. The statistical procedures performed confirm that all the measured hypotheses are supported and that the factors under investigation as detailed in the hypotheses have an impact on the overall development of e-government in Zambia. From the analysis of the hypotheses, the regression model is discussed below.

4.6 Regression Model

The regression model was used to map out the impact of the identified factors using enhanced EFA on the intended continuous usage (likelihood of using e-government solutions in future) and development of e-government in Zambia. This is measured by the Continuance Usage (CU) of e-government solutions. The CU on all other variables was investigated using two approaches: first with original variables from the dataset and excluding cases with anomalies as per the casewise

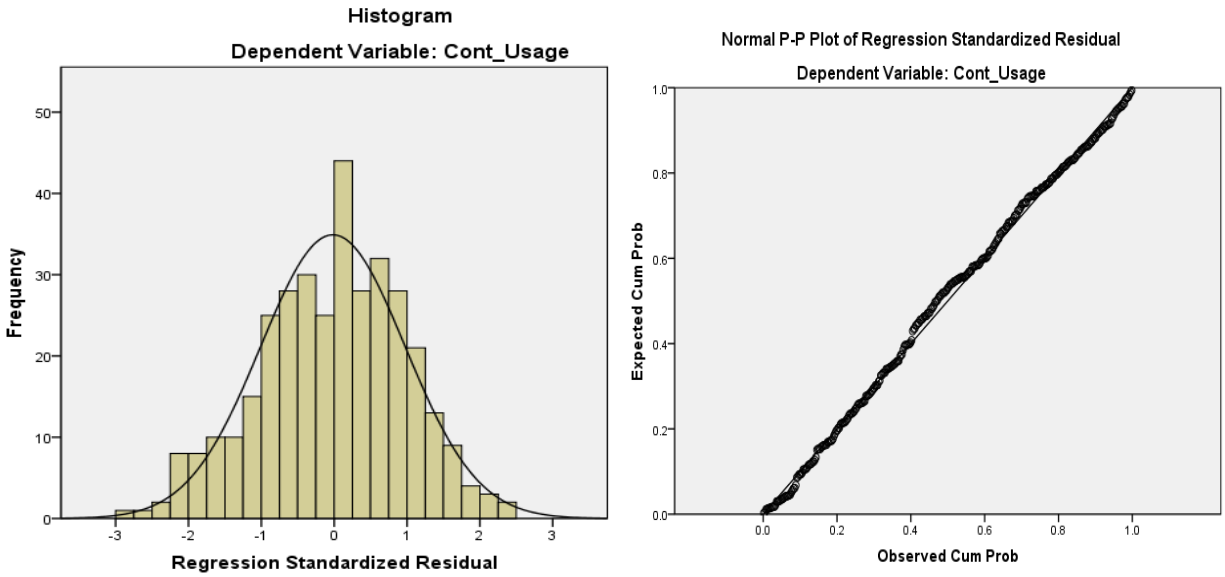
diagnostics, and second, using the logarithmic transformations of the variables (Log_ICTInfra, PEOU, Log_PU, Log_Actual_Usage, and Log_Comp_SE) to eliminate incidences of skewness. The following correlations for the individual factors were utilised: -0.404 for Log_ICTInfra; 0.250 for PEOU; -0.176 for Log_PU; -0.259 for Log_Actual_Usage; -0.254 for Log_Comp_SE; and 0.172 for Trust with 0.001 level of statistical significance. All requested variables on the extracted factors log_CU is the dependent variable.

The R^2 value for this test is 0.231 which entails that 23.1% of the variation in the outcome is determined by the predictor variables. The regression analysis predicting CU from the impact of the extracted factors was highly statistically significant with $F(1) = 17.652$, $P < .001$. It can be observed that the *t* values associated with the CU scores are significant at the same level as the F statistics (0.001). The regression equation is shown below:

$$CU = 4.030 – 1.668\ x_1 + 0.137\ x_2 + 0.046\ x_3 – 0.176\ x_4 – 0.511\ x_5 + 0.042\ x_6$$

Where x_1 = Log_ICTInfra; x_2 = PEOU; x_3 = Log_PU; x_4 = Log_Actual_Usage; x_5 = Log_Comp_SE; x_6 = Trust

The residual statistics shown in Figure 2 (showing the linearity in the regression analysis) confirmed that the Mahalanobis distance has an acceptable value.



a) b)

Figure 2: a) Gaussian normal data fit of CU on all other variables; b) P-P plot for standardised residue of CU on all other variables

Figure 2 has shown that the data follows a linear regression model and hence confirms the validity of the multivariate analysis used in this study. The CU demonstrates the willingness of the potential e-government consumers in Zambia to adopt and continue using e-government applications. This shows the potential of e-government development in Zambia.

The proposed conceptual adoption model for e-government development in Zambia is presented in figure 3 below. This model is a result of testing the hypothesis. Note that H8 did not get into this model because it does not satisfy the statistical aspirations to considerably contribute to continuance usage of e-government applications.

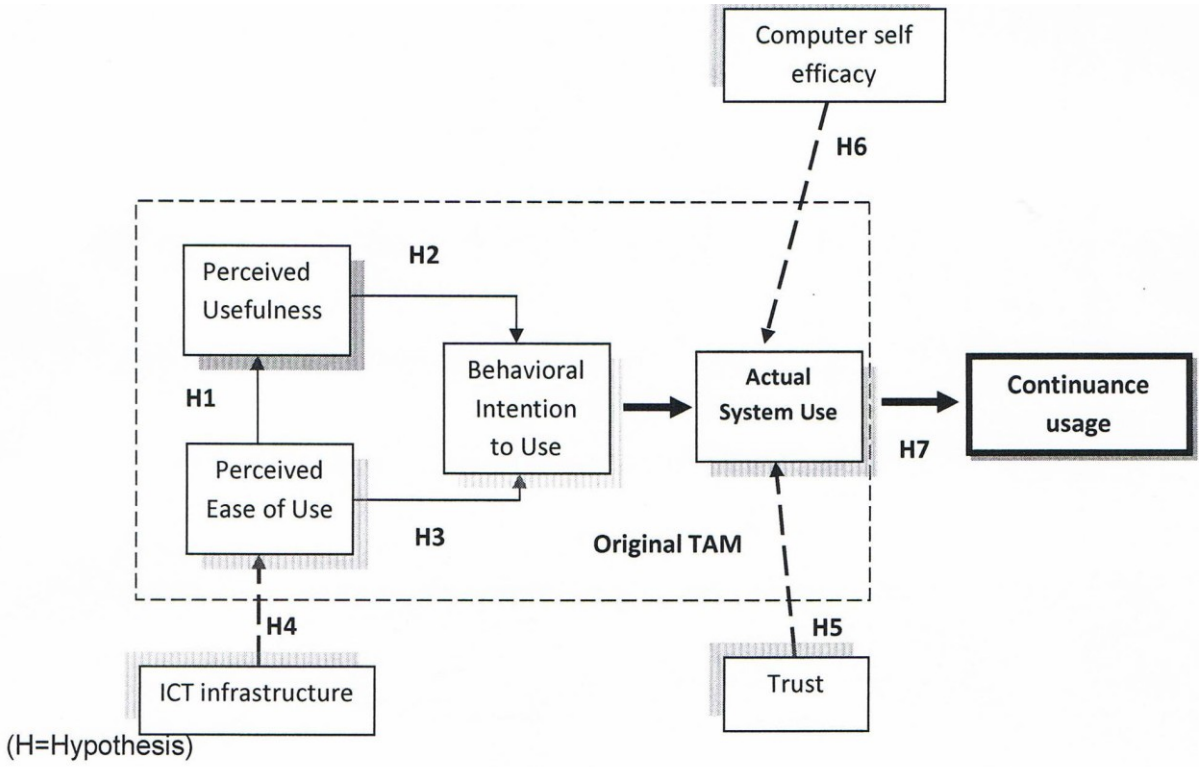


Figure 3: Proposed conceptual e-government adoption model for Zambia

A summary of the responses obtained during the testing of the hypotheses is presented below.

On the question regarding reliability of information on government websites: Over 61% of the respondents indicated non-reliability of information on the e-government websites - 69% indicated that there are no policies in place to protect the user in the online environment and 84% indicated that there are no security policies stated on e-government websites. In addition, 84% of the respondents mentioned that they would not allow the government to share their information with other sites or store it in a central repository;

The question on awareness about e-government services in Zambia showed that about half (49%) of the respondents indicated that they were not aware at all of any e-government services in Zambia; only 30% said they were moderately and slightly aware and the rest indicated that they were fully aware of e-government services in Zambia;

On the question of challenges (barriers) affecting effective development of e-government in Zambia, 68% of the participants identified the following as the inherent challenges: limitation in ICT skills; lack of readily available and affordable Internet access points; lack of e-government services relevant to the local context; lack of user-friendly e-government platforms; risk of information to end up in hands of unauthorised individuals; fear of change on part of the customer and/or government staff; limited ICT skills on the part of the customer and government employees; customers' limited experience in interacting with ICT platforms and the Internet; non-availability of native language (mother tongue) option on the website which could help the customer to perform tasks better; lack of protection of the end-user in the online environment; and lack of awareness campaigns on the benefits of engaging in e-government;

Close to 50% of the respondents indicated that they have the necessary requisite ICT skills to use a computer efficiently to effectively engage in e-government services. However, usage of e-government applications is low as only 27% of the respondents access e-government applications; and

Over 50% of the respondents acknowledge the **ready availability of Internet connectivity**. However, global access to the Internet is hampered by expensive usage fees, non-availability of appropriate and readily accessible ICT infrastructure, non-availability of native language options, and lack of appropriate awareness campaigns on the benefits of e-government.

Generally, a majority of the participants outlined the challenges that may be acting as barriers to the proliferation of e-government in Zambia. It is logically acceptable to believe that once these challenges are addressed, there is a chance that e-government can thrive in Zambia. In an attempt to address the aforementioned challenges, a lot of interventions (supply side) are being done to facilitate positive e-government development in Zambia. The International records Management Trust (IRMT, 2007) provides a summary of some of the major interventions which kick-started the ongoing interventions for the advancement of e-government as listed in Table 13 below.

Table 13: Information Management Interventions in Zambia

Date	Intervention	Anticipated impact
2006	Launch of public service management project	Aims to right size the public service, and to implement the pay and performance management reforms that the Government had pursued since 1993
2007	Introduction of a computerized human resource and payroll system	Towards better control of the establishment, improve information handling, eliminate loss of vital information and improve work flow processes
2007	Launched ICT policy	Among others, to support permeating of e-government and information systems in the public sector
2007	Introduction of the Payroll Management and Establishment Control (PMEC) system	Improve information flows between the central Public Service Management Division, ministries, departments, regional and district offices, and the Ministry of Finance
2007	Integrated payroll management system with Integrated Financial Management Information System (IFMIS).	strengthen payroll integrity
2007	Implementation of the integrated Public Management Establishment Control (PMEC) System	To control the abuse prevalent in an older system that had resulted in ghost workers on the payroll and unapproved allowances being awarded to employees
2003	Computerization of the Customs system at the Zambia Revenue Authority through the Automated SYstem for CUstoms Data (ASYCUDA), (Nkamba, 2011)	Aim for improving internal efficiencies and provide value-adding business options in the revenue collection business.
2008	Introduction of the Zambia Immigration Management System (ZIMS)	Introduction of the Electronic Passport System and electronic Visa application system

The initiatives shown in Table 13 were conceived with the understanding that their effective implementation will culminate into improved information management practices in the public service. This will in turn positively impact on the quality of the public service delivery. Despite the initiatives outlined in Table 13, the empirical study has shown that lack of appropriate access to information systems is a major bottleneck in the e-government development in Zambia and entails that citizens cannot effectively participate in the various socio-economic frameworks. It is evident from the literature review that there is paucity in the ICT infrastructure in Zambia may be responsible for low Internet and information accessibility by the citizens. In order to address the infrastructure problem, government parastatals and other private entities have joined hands to put in place the requisite ICT infrastructure needed for appropriate information access and management thereof.

In promoting universal access, one of the interventions executed has been the liberalisation of the international gateway in an effort to bring down access costs. The recent (in the year 2010) liberalisation of the international gateway has resulted in significant tariff reductions in as far as access to the Internet and usage of ICTs is concerned. Further, in pursuit of promoting and facilitating faster growth in Internet penetration, the government ushered in the new licensing regime under the ICT Act of 2009 and expects operators to extend Internet services to all parts of the country using broadband technologies. This has culminated into mobile operators' provision of Internet access through mobile phones resulting in tremendous increase in people (over 600,000) accessing the Internet through mobile gadgets.

The institutional forces as outlined by the insitutionalisation theory are readily seen in the different interventions that have been put in place to encourage e-government development in Zambia. It is

evident that there are robust interventions being pursued on the supply side but challenges are abundant on the demand side as a majority of the would-be e-government consumers do not even understand its importance, have challenges in finding relevant ICT infrastructure or platforms to access e-government applications and generally the public service employees are not mandated by their institutions to manage information using ICTs.

5 Conculsion

This article has analysed the likelihood of successful development of e-government in Zambia. To do this, both the supply and the demand side of e-government are discussed. On the supply side, the article utilises the TEF as a framework for introducing and enacting technology in the public service delivery value chains. This is complemented by the institutionalisation theory which posits that for e-government to be a success in governance channels, it needs to be recognised as one of the government institutional entities. The factors from the UTAUT and the TAM are also utilised to inform the hypotheses investigated in this study and intended to probe the factors that influence individuals to engage in e-government.

From the empirical study, it is evident that the probability to ensure successful e-government development in Zambia is high. Although there is no clear strategy and roadmap for e-government development in Zambia, the government and the stakeholders are committed enough to invest in affluent interventions (putting in place appropriate institutional and legal frameworks and erecting potent ICT infrastructures) for e-government advancement (Bwalya, Du Plessis & Rensleigh, 2011).

It can be concluded that a majority of the citizens in the upper level of the society, probably those in the administration, are willing to adopt e-government which will in the long run culminate into improving governance and the fight against corruption. In light of this, it can be posited that advancement of e-government in Zambia does not sprout from the opium of technological utopianism – there are real chances for public service revitalisation through the e-government platforms. Further, a sizable number of citizens agree that engagement in e-government comes with many benefits.

The testing of the hypotheses has identified inherent challenges that negatively influence e-government implementation. The identified challenges can be used to guide the design of robust e-government interventions to counteract them. This study posits that any fitting e-government interventions should be guided by the local context. It is not a hidden fact that context affects design as posited by common findings from social informatics research. Therefore, design of technology solutions in resource-constrained environments such as Africa (Zambia in particular) should be supported by empirically-rich initiatives that highlight more rigorous and nuanced alternatives to technological utopianism.

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References

Adeyemo, A.B. (2011). E-government implementation in Nigeria: An assessment of Nigeria's global e-gov ranking, Journal of internet and information system Vol. 2(1), pp. 11-19, January 2011. Available online at http://www.academicjournals.org/JIIS.

Al-Khouri, M.A. (2011). An innovative approach for e-government transformation, *International Journal of Managing Value and Supply Chains (IJMVSC*), 2(1), 22-43.

Anti-Corruption Resource Centre/Transparency International (2008). Overview of Corruption in Zambia. Retrieved on 8 January 2012 from http://www.u4.no/publications/overview-of-corruption-in-zambia/

Arduini, D., Belotti, F., Denni, M., Giungato, G., & Zanfei, A. (2010). Technology adoption and innovation in public services the case of e-government in Italy, *Information Economics and Policy*, 22, 257–275.

Bratton, M. (2011).Citizen Perceptions of Local Government Responsiveness in Sub-Saharan Africa, *World Development, Elsevier*, In Press.

Business Anti-Corruption Portal, (2011). Zambia Country Profile. Retrieved on 8 January 2012 from http://www.business-anti-corruption.com/country-profiles/sub-saharan-africa/zambia/show-all/

Bwalya K.J., Du Plessis, T., & Rensleigh, C. (2011).Setting the Foundation for e-Democracy in Botswana: An Exploratory Study of Interventions. In Information Communication Technologies and the Virtual Public

Sphere: Impacts of Network Structures. Cropf, R., & Krummenacher, W.S. (Eds.).Information Science Reference, Hershey, New York.229-241.

Bwalya, K.J. (2009). Factors affecting adoption of e-government in Zambia, *The Electronic Journal on Information Systems in Developing Countries (EJISDC),* 38, 1-13.

Bwalya K.J., & Healy, M. (2010).Harnessing e-government Adoption in the SADC Region: a Conceptual Underpinning, *Electronic Journal of e-government,* 8(1), 23-32.

Coates, N., & Nikolaus, L. (2010). Zambia and e-government: An Assessment and Recommendations. In E-Agriculture and E-government for Global Policy Development: Implications and Future Directions. Maumbe, B. (Ed.). 137-161.

Davis, G. B. (1982): Strategies for Information Requirements Determination. *IBM Systems Journal,* 21 (1), 4–30.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(319-340).

Dutta, S., & Mia, I. (2010).GICT for Sustainability. Retrieved November 2, 2011, from http://www.itu.int/wsis/implementation/2010/forum/geneva/docs/publications/GITR%202009-2010_Full_Report_final.pdf.

Editorial (2008). The E-government paradox: Better customer service doesn't necessarily cost less, Government Information Quarterly 25, 149–154.

Fountain , J. (2001). Building the Virtual State: Information Technology and Institutional Change.Washington, DC: Brookings Institution Press.

Gottschalk, P. (2009). Maturity levels for interoperability in digital government. *Government Information Quarterly*, 26, 75–81.

Hamooya, C. (2006). Records and good governance: Running away from accountability: the case of Zambia *ESARBICA Journal: Journal of the Eastern and Southern Africa Regional Branch of the International Council on Archives*. ISSN: 0376-4753.

Heeks, R. (2003). Achieving Success/Avoiding Failure in e-government Projects, IDPM, University of Manchester. Retrieved November 2, 2011, from http://www.egov4dev.org/success/sfdefinitions.shtml.

Henriot, P.J. (2007). Corruption in Zambia: is it inevitable? Can we stop it? Presentation in JCTR 2007 Series, Lusaka, Zambia. Retrieved January 3, 2011 from http://www.jctr.org.zm/publications/AFLPresentation/AFLcorruption07.pdf.

IRMT (2007). Fostering Trust and Transparency in Governance: ZAMBIA CASE STUDY. Investigating and Addressing the Requirements for Building Integrity in Public Sector Information Systems in the ICT Environment. Retrieved January 3, 2012, from www.irmt.org/.../case_studies/IRMT_Case_Study_Zambia.pdf

Kafunda, C. (2007). Zambia's experince in activities towards combarting corruption. A Paper Presented at the United Nations Economic Commission For Africa (UNECA) Committee On Human Development And Civil Society Fourth Meeting, Addis Ababa, Ethiopia From 19th to 20th November 2007. Retrieved January 3, 2011 from http://www.uneca.org/dpmd/events/corruption/Zambia.pdf. (Accessed 14 December 2010).

Johnson, R.B., Onwuegbuzie, A.J., & Turner, L.A. (2007). Toward a definition of mixed research design, *Journal of mixed methods research*, 1(2), 112-133.

Jones, S., Irani, Z., & Sharif, A. (2007). E-government evaluation: Reflections on three organisational case studies, Proceedings of the 40th Hawaii International Conference on System Sciences.

Kažemikaitienė, E., & Bilevičienė, T. (2008).Problems of involvement of disabled persons in e-government.Technological and economic development.*Baltic Journal on Sustainability*. 14(2), 184-196.

Lopez-Nicolas, C., & Soto-Acosta, P. (2010).Analyzing ICT adoption and use effects on knowledge creation: An empirical investigation in SMEs, *International Journal of Information Management*, 30, 521–528.

Luna-Reyes, L.F., & Gil-Garcia, J.R. (2011).Using institutional theory and dynamic simulation to understand complex e-government phenomena, *Government Information Quarterly*, 28, 329–345.

Matenga, C.R. (1998). Corruption: is it endemic in Zambia? Published on the Internet by the SAP - Project, Electronic Publications from the University of Zambia, Lusaka. Retrieved January 3, 2011 from http://www.fiuc.org/iaup/esap/publications/zambia/corruption.pdf.

Maumbe, B.M., Owei, V., & Alexander, H. (2008).Questioning the pace and pathway of e-governmentdevelopment in Africa: A case study of South Africa's Cape Gateway project, Government Information Quarterly, 25, 757–777.

Neville S. A.D. (2003). Information Revolution, Digital Divide and Development Paradox: A Global Framework for ICT Policy Formulation, Document WSIS/PC-3/CONTR/162-E. Retrieved December 3, 2011 from www.itu.int/dms_pub/itu-s/.../S03-WSISPC3-C-0162!!PDF-E.pdf.

Ngulube, P., Mokwatlo, K., & Ndwandwe, S. (2009). Utilisation and prevalence of mixed methods in library and information research in South Africa 2002-2008. *South African Journal of Library and Information Science*, 72(2), 105-116.

Ochara-Muganda, N., & Van Belle, J.P. (2010). A Proposed Framework for E-government Knowledge Infrastructures for Africa's Transition Economies, Journal of e-government Studies and Best Practices, 9p. Retrieved November 6, 2011, fromhttp://www.ibimapublishing.com/journals/JEGSBP/2010/303226/303226.pdf.

Oltmann, S.M., Rosenbaum, H., & Hara, N. (2007). Digital access to government information: To what extent are agencies in compliance with EFOIA? Proceedings of the American Society for Information Science and Technology, 43 (1), 190 – 190.

Rokhman, A. (2011). Potential Users and Critical Success Factors of e-government Services: The Case of Indonesia. *International Conference on Public Organization: ICONPO 2011,* 231-244). Yogyakarta: University of Muhammadiyah Yogyakarta.

Sarantis, D., Charalabidis, Y., & Askounis, D. (2011). A goal-driven management framework for electronic government transformation projects implementation, *Government Information Quarterly*, 28, 117–128.

Shalini, R.T. (2009). Are Mauritians ready for e-government services? *Government Information Quarterly,* 26: 536–539.

Shareef, A. M., Kumar, V., Kumar, U., & Dwivedi, Y.K. (2011).E-government Adoption Model (GAM): Differing service maturity levels. *Government Information Quarterly*, 28, 17–35.

Tangier (2002). Good Governance in Zambia's Public Administration Challenges & Opportunities. Retrieved December 12, 2011, from www.unpan1.un.org/intradoc/groups/public/.../UNPAN009299.pdf.

Tsai, N., Choi, B., & Perry, M. (2009).Improving the process of E-government initiative: An in-depth case study of web-based GIS implementation, *Government Information Quarterly*, 26, 368-376.

UN e-government Report (2008). UN E-government Survey 2008: From E-government to Connected Governance, ISBN 978 -92-1-123174-8, UN White paper.

UN e-government Survey (2010).Leveraging e-government at a time of financial and economic crisis.Retrieved November 6, 2011, fromhttp://unpan1.un.org/intradoc/groups/public/documents/un/unpan038851.pdf.

Weerakkody, V., Dwivedi, Y. K., Brooks, L., Williams, M. D., & Mwange, A. (2007). E-government implementation in Zambia: Contributing Factors. *Electronic Government, An international Journal, 4*(4), 484-505.

Yang, T.M., & Maxwell, T.A. (2011). Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors, *Government Information Quarterly*, 28, 164–175.

